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THE PLACEMENT OF ENGINEERING AND TECHNOLOGY GRADUATES 1981

AAES

ENGINEERING MANPOWER COMMISSION

OF THE

AMERICAN ASSOCIATION OF ENGINEERING SOCIETIES, INC.

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PLACEMENT of ENGINEERING and TECHNOLOGY GRADUATES

1981

A Report of An Annual Survey conducted by the ENGINEERING MANPOWER COMMISSION

A Commission of the Engineering Affairs Council
of the
American Association of Engineering Societies, Inc.
345 East 47th Street
New York, New York 10017

AMERICAN ASSOCIATION OF ENGINEERING SOCIETIES, INC.

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ACKNOWLEDGMENTS

The survey on which this report was based was conducted by Judith A. McCormick of the EMC staff under the general supervision of Patrick J. Sheridan, Manager of Manpower Activities. The compiled data were processed by Arthur W. Gilmore, a consultant to EMC.

This report was written and prepared by Mr. Gilmore and Ms. McCormick. Overall direction for the conduct of the survey and the preparation of this report was provided by Louis Marturana, Chairman of the Placement Survey sub-committee of EMC.

We owe particular thanks to the many deans and placement officials who participated in the survey. Without their cooperation we would be unable to conduct this annual study.

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INTRODUCTION

This is a report of the twenty-second annual survey of the placement of engineering and technology graduates conducted by the Engineering Manpower Commission (EMC) of the American Association of Engineering Societies, Inc. (AAES). The results of the 1981 survey, which compiles data on 49,846 graduates of over 330 U.S. engineering and technology schools, clearly show a sustained demand for engineers and technicians and technologists. (For a listing of participating institutions, please see the appendix.)

The survey seeks to ascertain the placement status of engineering and technology graduates as of the date of graduation, which varies from school-to-school. The data is gathered from deans and placement officers, is carefully checked for accuracy and completeness, and then is processed in a format to show statistically meaningful results. Respondents are asked to exclude evening students (presumably who are employed during the day) and foreign nationals (who are under visa limitations not to accept employment in the U.S.).

Major placement categories identified in the survey are "Newly Employed," "Returning to a Previous Job," and "Full-Time Graduate Study." Since the latter category is of particular importance to engineering college deans (in relation to graduate enrollments and as a future source of faculty staffing), the respondents have been asked to identify the graduate program selected as either "technical" or "non-technical."

In response to the needs of industry and academia, this year's survey has elicited more detailed information on the placement of doctorate graduates.

While there is no single measure of success in the placement of new graduates, certain indicators confirm that 1981 was a very good year. Starting salaries accepted by graduates continued to move upward with average increases of 10.6% for bachelor of engineering graduates, while the Consumer Price Index (CPI) rose by 10.8% during the past year, down from 13.2% reported a year ago.[1]

The placement status of engineering graduates at each degree level is shown graphically in Figure 1, on page 2. With each placement category is shown the "delta change" in the reported value compared to last year. [Delta (Δ) is equal to the 1980 percentages less the 1981 percentages.]

The most notable changes occurred in the category of "Full-Time Graduate Study" at the master's degree level, which dropped 3% from last year, and in the category of "Newly Employed" at the doctorate level which showed a 7% drop from last year. To a certain extent, these changes are offset by an increase in those "Returning to a Previous Job" in the case of the master's degree. This year we noted a 3% increment in the doctorate graduates continuing with post-doctorate graduate work.

Students about whom no information was known by the placement office were listed as "No Information Available," and were recorded to assure completeness of the data reported. However, these data were not used in computing the statistics. We have found in past surveys that the statistics tend to remain constant within a narrow range regardless of whether or not schools with a high proportion of "No Information Available" graduates were counted.

COMPARISON WITH OTHER FIELDS

The College Placement Council (CPC) has reported the number of hires made in four general fields of specialization—engineering, science and mathematics, business, and "non-technical." As indicated in Table 1, on page 3, the reported distribution of hires in 1981 shows that engineering graduates accounted for 37% of the hires at the bachelor's level, 24% at the master's level, and 38% at the doctorate level. This is in spite of the fact that engineering has by far the smallest percentages of the graduates at all three degree levels.

Next year's engineering employment climate will continue to be influenced by political and economic decisions, not to mention continuing concern about inflation, the international balance of trade, and the stability of the world economy in general. Increased spending for defense, energy and other R & D programs should stimulate demand. Increasing enrollments in recent years, as recorded by the EMC annual surveys of enrollments in engineering and technology, make larger graduating classes a certainty for the next four or five years. However, this year many colleges of engineering were forced to place a cap on enrollments because of limitations of faculty and essential laboratory equipment.

SPECIAL SURVEY OF DOCTORATE RECIPIENTS

The competition for Ph.D. graduates in engineering was very keen this year. This is testified to by the fact that the average salary acceptance for all fields at the Ph.D. level reported in our survey was $31,752 per year (343 salaries reported). This is in contrast to the $17-21,000 paid to beginning assistant professors in many colleges of engineering.[2] At the bachelor's level the average salary acceptance in 1981 was $22,716.

Because of the increasingly serious problem of staffing teaching faculties, it was decided to initiate an additional survey this year to permit tracking the ultimate placement of doctorate graduates. The results of this survey are shown in Table 2, on page 3.

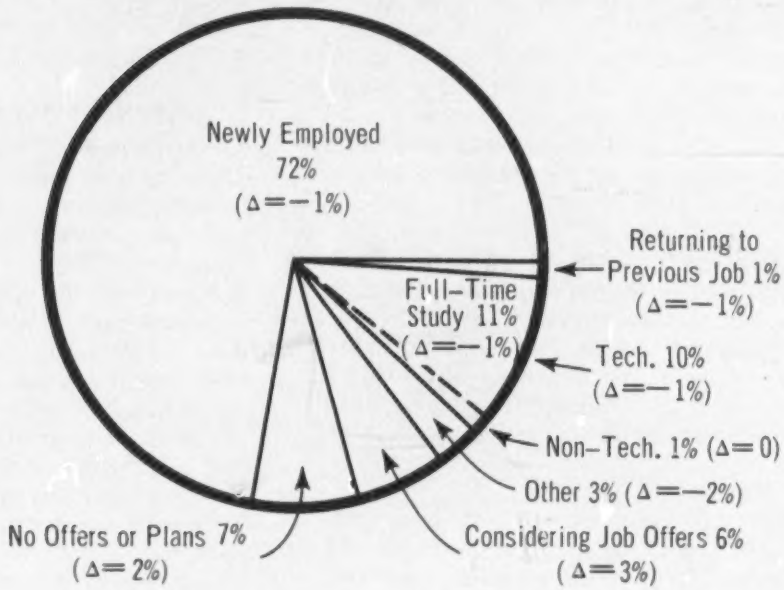
According to this year's survey, academia is receiving on the order of 30% of the doctorate recipients, whereas industry obtains over 50% and government around 10%. Because of widespread concern about the placement of doctorate graduates, this special survey will be continued.

[1]Consumer Price Index for urban consumers based on 1967 = 100%. Data reported are for the change from July, 1980 to July, 1981.

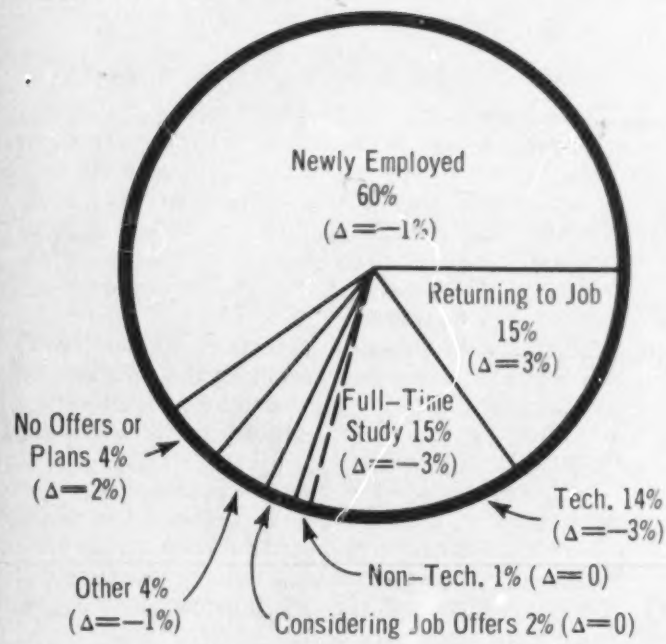
[2]From unpublished data from the EMC survey, "Professional Income of Engineers, 1981."

PLACEMENT OF ENGINEERING GRADUATES, 1981

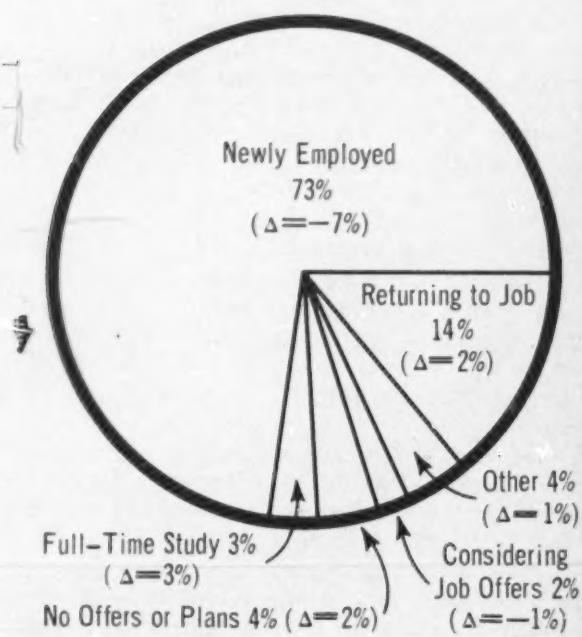
FIGURE 1



BACHELOR'S DEGREE



MASTER'S DEGREE



DOCTORATE DEGREE

TABLE 1

COMPARATIVE DISTRIBUTION OF COLLEGE GRADUATES VERSUS HIRES FOR SELECTED MAJOR FIELDS 1980-81 SCHOOL YEAR

	Bachelor's		Master's		Doctorates	
	% Degrees	% Hires	% Degrees	% Hires	% Degrees	% Hires
Engineering	6	37	4	24	7	38
Science & Math.	13	14	7	20	24	57
Business	16	41	15	53	3	1
Other Non-Technical	65	8	74	3	66	4

Source: % Degrees estimated from *Projections of Education Statistics to 1986-87*, M.M. Frankel, ed., National Center for Education Statistics, Washington, 1978.

TABLE 2

EMPLOYMENT DISTRIBUTION OF 1981 ENGINEERING DOCTORATE RECIPIENTS

	Industry	Government	Education	Combined
Number Newly Employed	447	55	292	792
Percentage Newly Employed	56.1	6.9	36.6	100
Number Currently or Previously Employed	185	48	95	328
Percentage Currently or Previously Employed	56.4	14.6	28.9	100

PLACEMENT AND STARTING SALARIES OF 1981 ENGINEERING GRADUATES

OVERALL PLACEMENT

The overall placement status of 1981 engineering graduates is given in Table 3 (see page 8), which includes the numbers of graduates reported in each category, allowing comparison of the information for different degree levels. Notable is the reduction in percentages of both bachelors' and masters' graduates who elected to continue in full-time graduate study. When compared to last year's data, the bachelors' figure is down by 1% and the masters' figure by 3% (see Figure 1, page 2).

OVERALL STARTING SALARIES

Starting salaries accepted by engineering graduates were obtained through this year's survey and are presented in Table 4, page 8. As a basis for comparison, values of starting salary *offers* for the four most popular engineering disciplines, as compiled by CPC, are shown in Table 5, on page 9.

BACHELOR OF ENGINEERING GRADUATES

Trends in the placement of bachelor of engineering graduates over the past decade are shown in Table 6, page 9. The effects of the sharp cuts in the defense and space programs during 1970-72, the recovery beginning in 1973, followed by the accelerating inflation and growing problems of environmental and energy control are readily apparent.

This year, the percentage of graduates without job offers or other plans increased to 7% from 5% last year. The percentage employed decreased from 75% to 73% over the past year, and, as mentioned above, the percentage of students going on to full-time graduate study decreased from 11% to 10%. The percentage of students mulling over job offers doubled from 3% to 6%. (Variations of one or two percentage points in most of the categories can result from minor differences in survey coverage each year or even from rounding off the statistics, but over a span of years real trends are evident.)

Table 7, page 10, gives the breakdown of placement by major curriculum. Among trends that have been relatively consistent over the past years is a tendency for graduates in the engineering sciences, general engineering, nuclear engineering and "all other" engineering categories to continue on to advanced degrees. In this instance, Figure 1, page 2, shows that the preference in the graduate study is heavily oriented to the technical rather than non-technical programs (over 10-to-one in favor of technical).

Recently, ceramic engineering graduates have shown a preference for further study, but only 3% of the petroleum engineering graduates fell into this category, largely because of the exceptionally high starting salaries in this field (see Table 4, page 8). During 1981, ceramic engineering and ocean engineering graduates had the highest percentage of graduates without job offers or plans (19% in each case).

MASTER OF ENGINEERING GRADUATES

Placement at the master's degree level in 1981 is shown in Table 8, page 11. Last year the percentage of masters' candidates that were pursuing further graduate study had increased to 18% from a 3-year low of 15%. In 1981, this category again declined to 15%. This is not too surprising in view of the fact that the average salary accepted by a master's degree recipient was nearly $2,100 per month, as shown in Table 4, page 8. This is on the order of five times the level of an academic stipend for a graduate student employed as a teaching or research assistant.

The number returning to jobs previously held was up by 3% this year, and those without offers or plans increased by 2%. Referring to the breakdown by curriculum shown in Table 9, page 11, it will be noted that materials science and engineering is in the weakest position with 12% in the "No Offers" category.

DOCTORATE DEGREE GRADUATES

Eighty-seven percent of engineering doctorate degree recipients were employed, as contrasted with 73 percent at the bachelor's level and 75 percent at the master's degree level. Table 10, page 12, shows how the placement situation for this group has varied over the years. Generally, doctorate graduates in engineering are new entrants in the job market, but this year 14 percent were returning to jobs previously held. Three percent of this year's doctorate candidates elected to engage in post-doctorate study.

In the various specialities, as shown in Table 11, page 12, systems engineering has the highest percentage (17%) in the unplaced category. It should be noted, however, that the doctorate statistics are based on small numbers of graduates in most instances and the percentages should be viewed with caution. Overall, the placement experience for doctorate engineering graduates since 1973 has been very good in contrast to the experiences of Ph.D. holders in non-technical fields. National statistics (including those shown in Table 2, page 3) indicate that over half of all doctorate engineers are employed in industry, while in most other fields, academic employment is predominant.

Salaries accepted by doctorate degree graduates continued their upward trend, as shown in Table 4, page 8. The overall average annual salary acceptance for 1981 was $31,680, up 16% over the 1980 level.

TABLE 3

PLACEMENT OF 1981 ENGINEERING GRADUATES BY DEGREE

	B.S.		M.S.		Ph.D.	
	No.	%	No.	%	No.	%
Accepted Job Offer	16,644	72	1,039	60	307	73
Returning to a Previous Job	345	1	267	15	57	14
Entering Full-Time Graduate Study	2,502	11	267	15	11	3
Other Plans	646	3	50	3	19	4
Considering Job Offers	1,402	6	41	2	8	2
No Job Offers, Seeking Employment	1,608	7	74	4	19	4
Total With Status Known	**23,147**	**100**	**1,738**	**100**	**421**	**100**
No Information	8,168	—	1,752	—	343	—
Total Reported	31,333	—	3,490	—	764	—

TABLE 4

MEAN MONTHLY STARTING SALARIES *ACCEPTED* BY 1981 ENGINEERING GRADUATES

	B.S.	M.S.	Ph.D.
Aerospace	$1,637	$1,966	$2,294
Architectural	1,690	—	—
Chemical	2,013	2,149	2,784
Civil	1,735	1,957	2,459
Computer	1,826	2,128	2,678
Electrical & Electronic	1,871	2,152	2,670
Mechanical	1,900	2,095	2,700
Metallurgical	1,939	2,075	2,543
Mining & Geological	1,956	2,249	2,489
Nuclear	1,852	2,042	2,460
Ocean	1,441	1,888	2,700
Petroleum	2,259	2,434	—
Overall	**1,893**	**2,098**	**2,640**
Total No. of Salaries Reported	22,882	1,912	342

TABLE 5

MEAN MONTHLY STARTING SALARIES *OFFERED* TO 1981 ENGINEERING GRADUATES

	B.S.	M.S.	Ph.D.
Chemical	$2,030	$2,207	$2,745
Civil	1,775	2,033	2,523
Electrical	1,882	2,138	2,793
Mechanical	1,908	2,125	2,659

Source: *CPC Salary Survey Formal Report No. 3, July, 1981,* College Placement Council, PA, 1981.

TABLE 6

PLACEMENT OF BACHELOR OF ENGINEERING GRADUATES 1970-1981

	Employed*	Entering Full-Time Graduate Study	Entering Military Service**	Other Plans	Considering Job Offers	No Job Offers Seeking Employment
1971	52%	20%	14%	2%	3%	9%
1972	54	20	9	2	5	11
1973	62	19	5	3	6	5
1974	67	17	4	2	4	6
1975	58	19	4	2	3	12
1976	58	18	3	3	3	14
1977	69	16	**	4	3	8
1978	75	13	**	4	3	5
1979	76	12	**	3	3	3
1980	75	12	**	5	3	5
1981	**73**	**11**	**	**3**	**3**	**7**

*Includes "Accepted Job Offers" and "Returning to a Previous Job."
**Combined with "Other Plans" starting in 1977.

TABLE 7

PLACEMENT OF BACHELOR OF ENGINEERING GRADUATES BY CURRICULUM, 1981

	Accepted Job Offer	Returning to a Previous Job	Entering Full-Time Graduate Study	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment	Number With Status Known
Aerospace	75%	1%	8%	6%	6%	3%	448
Agricultural	61	1	18	6	4	11	305
Architectural	71	0	9	3	10	8	132
Ceramic	58	1	17	0	5	19	154
Chemical	73	3	11	2	5	7	2,987
Civil	65	2	12	6	5	10	3,180
Computer	71	2	8	2	9	8	847
Electrical & Electronic	75	1	10	2	7	5	5,071
Engineering Science	59	0	24	3	4	9	209
General	55	1	32	2	3	8	453
Industrial	70	1	8	2	7	12	1,100
Materials Sci. & Eng.	67	3	19	1	6	4	159
Mechanical	76	1	9	2	7	5	5,222
Metallurgical	74	1	13	3	4	6	340
Mining & Geological	70	2	10	2	5	11	659
Nuclear	57	1	24	4	11	2	160
Ocean	72	0	0	1	8	19	332
Petroleum	94	0	3	1	2	0	420
Systems	67	3	11	1	10	7	181
Other	65	0	18	3	5	9	788
Overall	**72**	**1**	**11**	**3**	**6**	**7**	**23,147**

TABLE 8

PLACEMENT OF MASTER OF ENGINEERING GRADUATES 1972-1981

	Newly Employed	Returning to a Previous Job	Entering Full-Time Graduate Study	Entering Military Service*	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment
1972	38%	25%	19%	7%	4%	3%	4%
1973	45	17	22	7	6	2	2
1974	49	18	18	4	7	1	3
1975	52	13	18	2	7	1	7
1976	42	17	20	2	8	2	9
1977	58	18	15	*	3	1	4
1978	56	21	15	*	3	2	3
1979	59	16	15	*	3	4	3
1980	61	12	18	*	5	2	2
1981	**60**	**15**	**15**	*	**3**	**2**	**4**

*Combined with "Other Plans" starting in 1977.

TABLE 9

PLACEMENT OF MASTER OF ENGINEERING GRADUATES BY CURRICULUM, 1981

	Accepted Job Offer	Returning to a Previous Job	Entering Full-Time Graduate Study	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment	Number With Status Known
Aerospace	35%	17%	35%	9%	0%	4%	23
Agricultural	67	7	20	0	3	3	30
Chemical	70	2	21	2	2	4	187
Civil	65	10	14	4	1	6	214
Computer	65	11	18	4	0	1	98
Electrical & Electronic	63	18	10	3	2	4	414
Engineering Science	56	0	30	7	4	4	27
Industrial	50	30	8	6	4	3	104
Materials Sci. & Eng.	42	3	39	3	0	12	33
Mechanical	51	23	15	2	4	5	249
Metallurgical	76	6	18	0	0	0	17
Mining & Geological	60	8	28	2	2	0	50
Nuclear	73	5	14	2	5	2	44
Systems	55	18	12	2	8	4	49
Other	51	21	16	2	2	8	173
Overall	**60**	**15**	**15**	**3**	**2**	**4**	**1,738**

TABLE 10

PLACEMENT OF DOCTORATE DEGREE GRADUATES 1973-1981

	Newly Employed	Returning to a Previous Job	Entering Full-Time Graduate Study	Entering Military Service*	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment
1973	69%	11%	2%	3%	11%	3%	2%
1974	66	15	3	1	10	2	2
1975	69	12	2	2	6	1	8
1976	65	11	3	2	10	1	8
1977	75	13	3	*	3	1	4
1978	73	8	6	*	1	2	10
1979	79	9	3	*	3	3	3
1980	80	12	0	*	3	3	2
1981	**73**	**14**	**3**	*	**4**	**2**	**4**

*Combined with "Other Plans" starting in 1977.

TABLE 11

PLACEMENT OF DOCTORATE ENGINEERING GRADUATES BY CURRICULUM, 1981

	Accepted Job Offer	Returning to a Previous Job	Post-Doctorate Study	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment	Number With Status Known
Chemical	74%	14%	0%	6%	3%	3%	65
Civil	63	24	2	4	2	4	46
Computer	90	5	0	0	0	5	21
Electrical & Electronic	66	21	1	6	1	4	67
Engineering Science	86	0	5	5	0	5	22
General	50	50	0	0	0	0	22
Industrial	100	0	0	0	0	0	13
Materials Sci. & Eng.*	75	8	0	6	6	6	36
Mechanical	76	9	4	4	0	7	46
Metallurgical	68	18	5	9	0	0	22
Mining & Geological	86	14	0	0	0	0	22
Nuclear	65	12	0	12	6	6	17
Other	68	6	17	2	4	4	53
Systems	75	0	0	0	0	17	12
Overall	**74**	**13**	**3**	**4**	**2**	**4**	**476**

*Includes ceramic engineering.

PLACEMENT AND STARTING SALARIES OF 1981 TECHNOLOGY GRADUATES

OVERALL PLACEMENT

The placement status of technology graduates at the associate degree level and at the bachelor's degree level are shown in Figure 2, page 16. In the case of associate degree recipients, a sizeable reduction in those newly employed and those returning to a previous job (from 62% in 1980 to 55% in 1981) is almost balanced by the increase in those pursuing further study (from 19% in 1980 to 25% in 1981). In the case of the bachelor of technology graduates, a similar reduction in those employed (82% in 1980 to 76% in 1981) is essentially offset by the increment in those considering job offers (from 1% in 1980 to 8% in 1981).

BACHELOR OF TECHNOLOGY GRADUATES

Overall, bachelor of technology graduates were about as successful in finding jobs this year as were the graduates of engineering programs. Table 12, page 17, shows how they have fared over the years. While one can see many parallels with the trend in engineering, the most notable difference is the small number of technologists pursuing graduate study, which has held constant at 3% over the past three years.

Table 13, page 18, which represents the data broken down by curriculum group, shows that technologists are more likely than engineers to have jobs to which they are returning upon graduation (7% vs. 1%). On the other hand, the number of technologists with no offers was also larger (11% vs. 7%). In most other respects, placement differences between the various curriculum groups are minor.

The EMC salary data reported in Table 14, page 19, indicate an overall average starting salary for 1981 bachelor of technology graduates of $1,672 per month, which was about $221 less than the average for engineers, but up by 11 percent over last year. This represents a premium of about 13.2 percent for the engineering degree.

ASSOCIATE DEGREE TECHNOLOGY GRADUATES

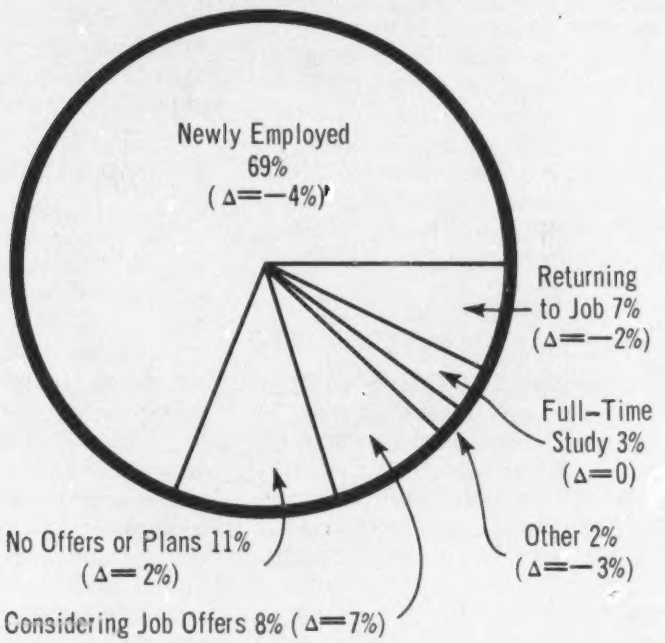
Table 15, page 19, illustrates the changes in placement status of associate degree technicians since 1971. From 1980 to 1981, the proportion going on to full-time study increased six percentage points, while the percentage employed fell by six points. The number without job offers or other plans increased three percent.

Table 16, page 20, gives the breakdown by curriculum for technology graduates. Here it is seen that advanced study is favored heavily by certain curricula, most notably aerospace, architectural, civil, electrical, electronic, and mechanical technology. Nuclear, industrial and "other" technology had the largest percentages of graduates without job offers; aerospace, electronic, and manufacturing technology had the smallest. In the employed category, manufacturing technology showed the largest proportion of graduates returning to jobs previously held.

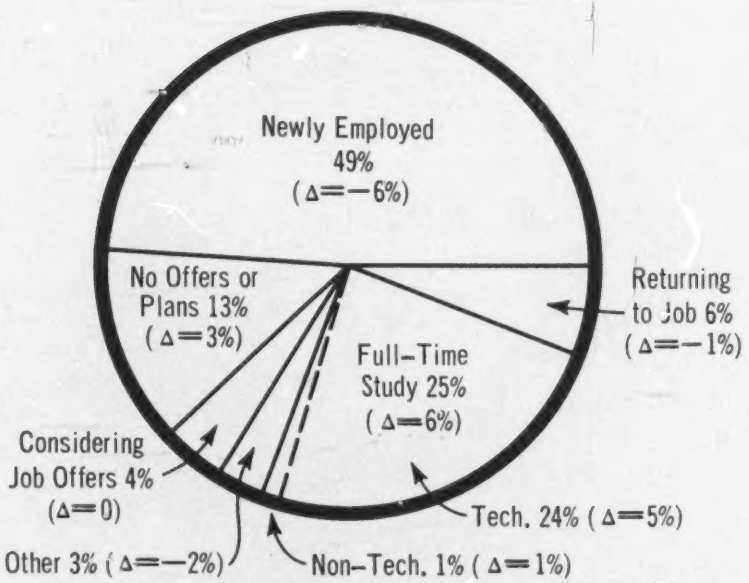
Starting salary statistics for associate degree graduates are given in Table 14 on page 19. As will be noted, the overall mean at the associate degree level is $300 less per month than at the bachelor's degree level.

PLACEMENT OF TECHNOLOGY GRADUATES, 1981

FIGURE 2



BACHELOR'S DEGREE



ASSOCIATE DEGREE

TABLE 12

PLACEMENT OF BACHELOR OF TECHNOLOGY GRADUATES
1971-1981

	Employed*	Entering Full-Time Graduate Study	Entering Military Service**	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment
1971	60%	5%	13%	4%	8%	11%
1972	67	5	7	2	12	7
1973	76	3	5	4	8	4
1974	75	4	3	3	5	11
1975	66	4	4	4	7	16
1976	74	6	2	4	5	10
1977	77	6	**	2	5	11
1978	82	2	**	2	4	10
1979	80	3	**	2	9	7
1980	82	3	**	1	5	9
1981	**76**	**3**	**	**2**	**8**	**11**

*Includes "Accepted Job Offers" and "Returning to a Previous Job."
**Combined with "Other Plans" starting in 1977.

TABLE 13

PLACEMENT OF BACHELOR OF TECHNOLOGY GRADUATES BY CURRICULUM, 1981

	Accepted Job Offer	Returning to a Previous Job	Entering Full-Time Graduate Study	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment	Number With Status Known
Aerospace	67%	0%	0%	0%	17%	17%	12
Architectural	52	2	2	9	17	19	64
Civil	68	3	5	1	8	15	286
Computer	71	5	4	1	2	18	108
Drafting & Design Tech.	68	11	2	7	2	11	57
Electric	69	11	2	1	10	7	244
Electronic	67	8	2	3	8	13	684
Industrial	76	7	2	2	6	6	620
Manufacturing	66	13	1	1	9	12	160
Mechanical	71	8	2	2	9	8	476
Other	66	5	4	2	10	13	637
Overall	**69**	**7**	**3**	**2**	**8**	**11**	**3,400**

TABLE 14

MEAN MONTHLY STARTING SALARIES ACCEPTED BY 1981 TECHNOLOGY GRADUATES

	B.S.	A.S
Air Conditioning	$1,669	$1,193
Architectural	1,441	1,031
Automotive Engineering Tech.	1,447	960
Chemical Engineering Tech.	1,723	1,524
Civil	1,582	1,208
Computer	1,553	1,245
Drafting & Design Tech.	1,633	1,227
Electrical	1,736	1,425
Electronic	1,698	1,330
Industrial	1,510	1,537
Manufacturing	1,725	1,306
Mechanical	1,797	1,538
Other	1,674	1,271
Overall	**1,672**	**1,371**

TABLE 15

PLACEMENT OF ASSOCIATE OF TECHNOLOGY GRADUATES 1971-1981

	Employed*	Continuing Full-Time Study	Entering Military Service**	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment
1971	47%	29%	8%	1%	8%	7%
1972	58	24	3	2	9	4
1973	61	25	1	1	7	5
1974	67	18	2	1	6	6
1975	59	23	1	1	4	11
1976	58	24	1	1	6	10
1977	64	17	**	5	4	10
1978	65	20	**	5	3	7
1979	63	20	**	4	6	7
1980	61	19	**	4	5	10
1981	**55**	**25**	**	**3**	**4**	**13**

*Includes "Accepted Job Offers" and "Returning to a Previous Job."
**Combined with "Other Plans" starting in 1977.

TABLE 16

PLACEMENT OF ASSOCIATE OF TECHNOLOGY GRADUATES BY CURRICULUM, 1981

	Accepted Job Offer	Returning to a Previous Job	Continuing Full-Time Study	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment	Number With Status Known
Aerospace	11%	5%	68%	16%	0%	0%	19
Air Conditioning	57	5	11	8	5	14	221
Architectural	41	7	29	4	4	16	545
Automotive Eng. Tech.	43	11	14	4	12	15	291
Chemical Eng. Tech.	61	3	22	0	2	12	103
Civil	43	3	31	2	6	15	563
Computer	58	5	15	3	4	15	933
Drafting & Design Tech.	57	7	15	3	6	13	576
Electrical	42	2	32	4	3	17	715
Electronic	56	6	25	3	4	5	1,886
Industrial	40	10	21	5	0	25	124
Manufacturing	57	19	11	3	6	3	150
Mechanical	47	6	30	2	5	11	902
Nuclear	36	0	0	0	36	29	814
Other	40	5	28	4	1	21	1,287
Overall	**49**	**6**	**25**	**3**	**4**	**13**	**8,229**

PLACEMENT OF WOMEN AND MINORITY ENGINEERING AND TECHNOLOGY GRADUATES

For the fifth year, the Engineering Manpower Commission asked for placement data on minority members and women in the graduating classes. The results were encouraging in that usable information was reported on 3,713 graduates from the five special groups in question. Table 17 gives the placement statistics for the bachelor's degree graduates in engineering only, since this group had the largest number of students reported.

As a general conclusion, the survey results support the impression generally held among engineering educators and employers that women and minority members are in strong demand. On the other hand, the data do not indicate extreme favoritism toward these groups, since the proportions without job offers or other plans are reasonably close to the average for all engineering and technology graduates.

Persons closely associated with programs aimed at increasing the representation of women and minorities in engineering have frequently pointed out that each of these groups must be considered individually because of its distinctive characteristics and special needs. The placement data is summarized below for each of the groups.

WOMEN

Compared with all engineering graduates at the bachelor's level in engineering (as shown in Figure 1, page 2), higher percentages were in the employed categories (either having accepted a job or returning to one previously held). These findings are consistent with the higher salaries and the relatively small number of women engineering graduates.

BLACKS

Again, referring to Figure 1, page 2, Table 17 shows that Blacks at the bachelor's level had a higher than average percentage of employment; also, a significantly larger than average percentage of Blacks are returning to jobs previously held. In contrast, a smaller number are continuing full-time study.

HISPANICS

Bachelor's degree graduates from this minority group had a higher than average percentage employed. The percentage going on to full-time study was about equal to the overall average at the B.S. level.

ASIAN/PACIFIC ISLANDERS

The most outstanding feature of this group is the high proportion of engineering graduates going on to further full-time study. This finding is consistent with past degree and enrollment statistics for Asian/Pacific Islanders. Few Asian/Pacific Islanders were reported from the technology schools in either associate or bachelor's degree programs.

AMERICAN INDIANS

The number of graduates from this minority group were too small to provide useful statistics except possibly at the bachelor of engineeing level. Virtually all graduates were either newly employed or going on to full-time study, but with only 12 bachelor's degree recipients reported, no conclusions should be drawn. (Please note that these 12 degrees represent 13.3% of the total number of bachelor's degrees in engineering awarded in 1981 to American Indians.[3])

[3]*Engineering and Technology Degrees, 1981*, Engineering Manpower Commission, American Association of Engineering Societies, N.Y., 1981.

TABLE 17

PLACEMENT OF WOMEN AND MINORITY BACHELOR OF ENGINEERING GRADUATES 1981

	Accepted Job Offer	Returning to a Previous Job	Entering Full-Time Graduate Study	Other Plans	Considering Job Offers	No Job Offers, Seeking Employment	Number With Status Known
Women	78%	2%	9%	2%	5%	4%	1,663
Blacks	75	4	9	1	5	6	304
Hispanics	78	3	10	3	2	5	189
Asian/Pacific Islanders	66	2	15	2	11	3	286
American Indians	92	0	8	0	0	0	12

APPENDIX

PARTICIPANTS IN THE 1981 PLACEMENT SURVEY
Alphabetical by State

Engineering Schools

Auburn University
University of Alabama
University of Southern Alabama
Arkansas State University
John Brown University
University of Arizona
California Institute of Technology
California State Polytechnic Institute
California State University—Chico
California State University—Fullerton
California State University—Sacramento
Harvey Mudd College
Humboldt State University
University of California—Davis
University of California—Irvine
University of California—Los Angeles
University of California—Santa Barbara
University of the Pacific
University of Redlands
Colorado School of Mines
Colorado State University
University of Colorado
Trinity College
U.S. Coast Guard Academy
University of Connecticut
University of Hartford
University of Delaware
University of District of Columbia
Howard University
Embry-Riddle Aero University
Florida Atlantic University
Florida Institute of Technology
University of Central Florida
University of Florida
University of Miami
University of Southern Florida
Georgia Institute of Technology
University of Georgia
University of Hawaii
Idaho State University
University of Idaho
Millikin University
Northwestern University
University of Illinois—Urbana-Champaign
Purdue University—Calumet
Purdue University—Indianapolis
Tri-State University
University of Evansville
Valparaiso University
University of Notre Dame
Iowa State University
Kansas State University
University of Kansas
Wichita State University
University of Kentucky
University of Louisville
Louisiana State University
Louisiana Technical University
Tulane University
University of Southwestern Louisiana
U.S. Naval Academy
Harvard University
Merrimack College
Southeastern Massachusetts University
Massachusetts Maritime Academy
University of Massachusetts—Amherst
Western New England College
Worcester Polytechnical Institute
Michigan State University
Michigan Technical University
Oakland University
University of Michigan—College of Engineering
Wayne State University
Western Michigan University
University of Minnesota
University of Mississippi
University of Missouri—Columbia
University of Missouri—Kansas City
University of Missouri—Rolla
Washington University
University of Nebraska
University of Nevada
University of New Hampshire
Dartmouth College
Monmouth College
New Jersey Institute of Technology
Princeton University—School of Engineering & Applied Science
Rutgers University
Stevens Institute
New Mexico State University
Clarkson College
Cooper Union
Cornell University
Polytechnic Institute of New York
Pratt Institute
Rensselaer Poly Institute
Rochester Institute of Technology
SUNY at Buffalo
SUNY College of Ceramics at Alfred
SUNY Environmental Science and Forestry
SUNY Maritime College
Syracuse University
Union College
University of Rochester
Webb Institute of Naval Architecture
North Carolina State University
University of North Carolina at Chapel Hill
University of North Dakota
Case Western Reserve
Cleveland State University
Marietta College
Ohio Northern University
Ohio State University
University of Dayton
University of Toledo
Wright State University
Youngstown State University
Northeastern University
Oklahoma State University
University of Oklahoma
University of Tulsa
Portland State University
Bucknell University
Carnegie Mellon University
Drexell University
Gannon University
Geneva College
Lafayette College
Pennsylvania State University
Swarthmore College
University of Pittsburg
Widener College
Wilkes College
Brown University
University of Rhode Island
South Dakota School of Mines and Technology
Christian Brothers University
Tennessee Technical University
University of Tennessee—Chattanooga
Vanderbilt University
Rice University
St. Mary's University
Texas A & I University
Texas A & M University
Trinity University
University of Houston
University of Texas, Austin
University of Texas, El Paso
University of Texas, Permian Basin
Brigham Young University
University of Utah
Utah State University
Norwich University
University of Vermont
Old Dominion University
University of Virginia School of Engineering & Applied Science
Virginia Military Institute
Virginia Polytechnic Institute and State University
Washington and Lee University
Gonzaga University
Saint Martin's College
Seattle University
Walla Walla College
Washington State University
West Virginia College of Mineral & Energy Resources
West Virginia Institute of Technology
West Virginia University
Institute of Paper Chemistry
Marquette University
Milwaukee School of Engineering
University of Wisconsin—Madison
University of Wisconsin—Platteville

Technology Schools

Puma Community College
De Vry Institute of Technology
California State Polytechnic University
California State University
Heald Institute of Technology
Pacific Union College
Mesa College
University of Southern Colorado
Central Connecticut State College
Cennecticut State Technical College
Norwalk State Technical College
University of Connecticut
University of Hartford
Broward Community College
Embry-Riddle Aeronautical University
Florida Institute of Technology
Flordia International University
Hillsborough Community College
Miami Dade Community College—South Campus

Palm Beach Community College
St. Petersburg Junior College
University of Central Florida
University of North Florida
University of South Florida
Georgia Southern College
Southern Technical Institute
Eastern Illinois University
Parkland College
Parks College
Rock Valley College
Southern Illinois University—Carbondale
Southern Illinois University—Evansville
Western Illinois University
Indiana State University
Purdue University—Calumet
Purdue University—Indianapolis
School of Engineering and Technology at Indianapolis
Clinton Community College
Hawkeye Institute of Technology
North Iowa Area Community College
Berry College
Johnson County Community College
Kansas State University
Kansas Technical Institute
Wichita State University
Morehead State University
Louisiana State University
Louisiana Technical University
University of Louisville—Speed Scientific School
University of Louisville
School of Engineering Technology, University of Maine at Orono
Capitol Institute of Technology
Prince George Community College
Cape Cod Community College
Greenfield Community College
North Shore Community College
Southeastern Massachusetts University
Wentworth Institute of Technology
Ferris State College
Gogobic Community College
Michigan Technological University
Northern Michigan University
Anoka-Ramsey Community College
Wayne State University
Western Michigan University
Moorhead State University
Northwestern Electronics Institute
Rochester Community College
St. Cloud State University
Jackson State University
Northwest Mississippi Junior College
Jefferson College
Missouri Institute of Technology
St. Louis Community College
University of Nebraska—Omaha
University of Nevada—Reno
New Hampshire Technical Institute
County College of Morris
Middlesex County College
New Jersey Institute of Technology
Union County Technical Institute
New Mexico State University
Broome Community College
Canton Agricultural and Technical College
Hudson Valley Community College
Mohawk Valley Community College
NYC Technical College
Orange County Community College
Queensborough Community College
Rochester Institute of Technology
SUNY A & T at Alfred
SUNY A & T at Morrisville
SUNY College of Technology at Utica/Rome
Ulster County Community College
Cape Fear Technical Institute
Central Piedmont Community College
Fayetteville Technical Institute
Forsyth Technical Institute
Lenoir Community College
Pitt Community College
Sandhills Community College
Western Carolina University
University of North Carolina—Charlotte
Bowling Green State University
Central Ohio Technical College
Cleveland State University
Franklin University
Miami University
Ohio University
Owens Technical College
Youngstown State University
University of Cincinnati
University of Dayton
University of Toledo Community and Technical College
Oklahoma State Technical Institute
Northeastern Oklahoma State University
Oregon Institute of Technology
Portland Community College
Community College of Allegheny County
Gannon University
Harrisburg Area Community College
Temple University
Community College of Rhode Island
Roger Williams College
Aiken Technical College
Clemson University
Orangeburg-Calhoun Technical College
Midlands Technical College
Sparkenburg Technical College
Sumter Area Technical College
South Dakota State University
Austin Peay State University
Middle Tennessee State University
Nashville State Tech
State Technical Institute at Knoxville
Tennessee Technical University
Del Mar College
San Antonio College
Texas A & M University
Texas Southern University
Texas State Technical Institute
Texas Tech University
University of Houston
Blue Ridge Community College
Dabney Lancaster Community College
Eastern Shore Community College
Thomas Nelson Community College
Norwich University
Vermont Technical College
Old Dominion University
Virginia Polytechnical Institute
Bluefield State College
West Virginia Institute of Technology
Milwaukee School of Engineering

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MEMBER SOCIETIES

American Society of Civil Engineers	1852
American Institute of Mining, Metallurgical and Petroleum Engineers, Inc.	1871
The American Society of Mechanical Engineers	1880
The Institute of Electrical & Electronics Engineers	1884
American Society for Engineering Education	1893
American Society of Heating, Refrigerating & Air-Conditioning Engineers, Inc.	1894
American Society of Agricultural Engineers	1907
American Institute of Chemical Engineers	1908
American Society for Metals	1913
National Council of Engineering Examiners	1920
Society of Manufacturing Engineers	1932
American Institute of Aeronautics and Astronautics	1932
National Society of Professional Engineers	1934
National Institute of Ceramic Engineers	1938
Society of Allied Weight Engineers, Inc.	1939
Society of Plastics Engineers, Inc.	1941
American Society for Quality Control	1946
Standards Engineering Society	1947
American Institute of Industrial Engineers, Inc.	1948
Society of Women Engineers	1950
Society of Fire Protection Engineers	1950
American Institute of Plant Engineers	1954
American Nuclear Society	1954
American Academy of Environmental Engineers	1955
American Association of Cost Engineers	1956
System Safety Society	1962
Association of Energy Engineers	1977
American Indian Science & Engineering Society	1977

ASSOCIATE SOCIETIES

The Tau Beta Pi Association, Inc.	1885
Air Pollution Control Association	1907
American Council of Independent Laboratories, Inc.	1937
American Congress on Surveying & Mapping	1941
National Association of Corrosion Engineers	1945
Federation of Materials Societies	1972
National Action Council for Minorities in Engineering, Inc.	1980

REGIONAL SOCIETIES

Western Society of Engineers	1869
The Cleveland Engineering Society	1880
Engineering Society of Detroit	1895
Washington Society of Engineers	1905
Colorado Society of Engineers	1916
Colorado Engineering Council	1919
Engineering Societies of New England, Inc.	1923
Quad-Cities Engineering and Science Council	1969

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